



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/529,316

03/25/2005

Takeo Azuma

5077-000237/NP

8647

27572 7590 10/21/2008  
HARNESSE, DICKEY & PIERCE, P.L.C.  
P.O. BOX 828  
BLOOMFIELD HILLS, MI 48303

EXAMINER

RASHID, DAVID

ART UNIT

PAPER NUMBER

2624

MAIL DATE

DELIVERY MODE

10/21/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/529,316	<b>Applicant(s)</b> AZUMA ET AL.	
	<b>Examiner</b> DAVID P. RASHID	<b>Art Unit</b> 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 September 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                      |                                                                   |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____                                                          | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

#### ***Continued Examination Under 37 CFR 1.114***

[1] A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on September 23, 2008 has been entered.

#### ***Amendments***

[2] This office action is responsive to the Amendment in Response to Final Office Action received on September 23, 2008. Claims 1-16 remain pending.

#### ***Response to Arguments***

[3] Remarks filed September 23, 2008 with respect to claims 1-16 have been respectfully and fully considered, but not found persuasive.

#### ***Summary of Remarks***

Claim 1 recites "wherein the eye is judged to be a counterfeit eye that is a reproduction of a living eye when roughness is detected in the image." The Examiner asserts that an eye of an imposter in Fig. 6 of Daugman corresponds to "a counterfeit eye." Applicant submits that Daugman at best appears to show that the imposter is a living person, rather than a reproduction of a living eye.

...

Claim 10 recites "extracting a predetermined feature from the band-limited image data." The Examiner asserts that generating the iris code shown in Fig. 4C of Daugman corresponds to this feature. Claim 10 further recites "recognizing whether the eye is a counterfeit eye that is a reproduction of a living eye, or a living eye based on data of the extracted feature." The Examiner asserts that Daugman suggests analogous features. Applicant respectfully traverses the Examiner's assertion for reasons presented above regarding claim 1.

(Applicant's Remarks at 8-9, September 23, 2008.)

#### ***Examiner's Response***

Art Unit: 2624

However, “a counterfeit eye that is a reproduction of a living eye” is broad enough to allow the interpretation that if the counterfeit eye was an image, that image itself is a “reproduction” of a living eye (and thus the counterfeit eye image is a “reproduction” of a living eye). The Examiner suggests further limiting what is meant by “reproduction” to further differentiate from the prior art of record. Examiner’s argument is analogous for claims 10, 12-13, and 15-16.

***Summary of Remarks***

The Examiner asserts that Flom teaches using the central moment as the predetermined feature. Applicant respectfully traverses the Examiner's assertion. Flom at best appears to show, at Col. 13, lines 20-40, that the central moment is used for detecting isolated crypts or small pigment spots, rather than the claimed roughness. Further, because Daugman fails to disclose detecting roughness in an image, one of ordinary skill in the art would not be able to modify Daugman based on the teaching of Flom to arrive at claim 3.

(Remarks at 8.)

***Examiner’s Response***

However, detected isolated crypts or small pigment spots is a form of “roughness”, as it is unclear what kind of “roughness” would further distinguish Applicant's invention from the use of *Flom*. The Examiner suggests further limiting what is meant by “roughness” to further differentiate from the prior art of record.

***Summary of Remarks***

In addition, claim 10 recites "performing band limitation to the whole, image data." The Examiner asserts that "quadrature bandpass filters" shown in Fig. 3 of Daugman correspond to "performing band limitation." Applicant respectfully traverses the Examiner's assertion. Daugman at best appears to show that quadrature bandpass filters are only used for the iris region of the eye image to generate the iris code, rather than for the whole image as recited in claim 10.

(Remarks at 9.)

***Examiner’s Response***

However, “best appear[ing] to show that quadrature bandpass filters are only used for the iris region of the eye image. . .” in fig. 3 is unpersuasive. The Examiner cannot find in the specification that positively recites this. In addition, “receiving image data of an image including an eye” may be interpreted such that the image data only comprises those pixels that make up the iris. This interpretation would also positively hold.

***Claim Rejections - 35 U.S.C. § 101***

[4] 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

**Claims 1-16** are rejected under 35 U.S.C. § 101 because the claimed invention is directed to non-statutory subject matter.

A judicial exception claim is non-statutory for solely embodying an abstract idea, natural phenomenon, or law of nature. *See* M.P.E.P. § 2106(IV)(C)(2). However, a practical application of a judicial exception claim is a § 101 statutory claim “when it:

- (A) ‘transforms’ an article or physical object to a different state or thing [(i.e., a physical transformation, see below)]; or
- (B) otherwise produces a useful, concrete and tangible result, based on the factors discussed below. . . .” *Id.*

§ 101 statutory transformations of intangible articles or physical objects must be physical transformations (i.e., a physical component to the transformation must be involved). *See* M.P.E.P. § 2106(IV)(C)(2) (requiring the element “provides a transformation or reduction of an article to a different state of thing”, a “practical application by physical transformation”) *and*

Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility,  
Official Gazette notice, 22 November 2005, Annex (II)(B)(iii); (III).

Image data (*e.g.*, a pixel) is a block of existing information as there is nothing tangible or physical about a image data itself (*i.e.*, a pixel could be equivalent to the value “101”, or signal representation of an image). A pixel is more representative of an information value or signal (an image block more representative of an information matrix) than something tangible or physical.

Furthermore, a claim including a method-step for inputting or outputting a pixel or image, but not indicating physically where the pixel or image is sent does not indicate a physical transformation, nor a useful, concrete and tangible result. The claim would require further information as to indicate physical location (*e.g.*, memory, display) for a complete physical transformation of an image signal (*e.g.*, pixel, image block) article. Claims 1-16 are non-statutory for being a judicial exception, an abstract idea.

***Claim Rejections - 35 USC § 102***

[5] The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

[6] **Claims 1-2, 4-14, and 16** are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,291,560 (issued Mar. 1, 1994, hereinafter "Daugman").

Regarding **claim 1**, *Daugman* discloses a counterfeit eye discrimination method (fig. 1) comprising the steps of:

receiving image data of an image ("FIG. 2 is a photograph of a human eye" at 3:50-51; "a digitized image as illustrated in FIG. 2" at 5:1-2; fig. 1, item 10) including an eye (fig. 2); and

detecting presence or absence of roughness (roughness is a measurement of a small-scale variation; thus the small-scale variation between the stored reference code of an original iris and that of the present code in computing Hamming distance is a measure of "roughness") in the image by image processing (fig. 1, item 26; fig. 6) to the image data;

wherein the eye is judged (fig. 1, item 28) to be a counterfeit eye (a counterfeit eye when the image is of an eye of an imposter in fig. 6) that is a reproduction of a living eye (the counterfeit eye is an image, the image itself is a "reproduction" of a living eye) when roughness is detected in the image.

Regarding **claim 2**, *Daugman* discloses the counterfeit eye discrimination method of claim 1, wherein the image processing includes the steps of:

performing band limitation ("quadrature bandpass filters" in 3:52-55; fig. 3; fig. 4) to the image data; and

extracting a predetermined feature (fig. 4C to generate the code when fig. 4B Gabor filter above or below 0 creating the Hamming distance) from the band-limited image data, wherein the presence or absence of roughness is detected (fig. 1, item 26; fig. 6) using the extracted feature data.

Regarding **claim 4**, *Daugman* discloses the counterfeit eye discrimination method of claim 2, wherein pixel coordinate values (“polar coordinate system” 5:1-11) are used in combination with pixel values (“1” or “0” in fig. 4C) in the extraction of the predetermined feature (fig. 4C to generate the code when fig. 4B Gabor filter above or below 0 creating the Hamming distance); code at the top of fig. 2).

Regarding **claim 5**, *Daugman* discloses the counterfeit eye discrimination method of claim 2, wherein a center of a pupil or an iris is used in combination (the polar coordinate system is centered around the center of the pupil and iris, thus the center of the pupil and iris being “used”) with pixel values (“1” or “0” in fig. 4C) in the extraction of the predetermined feature (fig. 4C to generate the code when fig. 4B Gabor filter above or below 0 creating the Hamming distance).

Regarding **claim 6**, *Daugman* discloses the counterfeit eye discrimination method of claim 2, wherein a high-pass filter or a band-pass filter (“quadrature bandpass filters” in 3:52-55; fig. 3; fig. 4) is used in the band limitation.

Regarding **claim 7**, *Daugman* discloses the counterfeit eye discrimination method of claim 2, wherein the extraction of the predetermined feature (fig. 4C to generate the code when fig. 4B Gabor filter above or below 0 creating the Hamming distance) is performed to a vicinity (fig. 2 where it is in a “vicinity” of both the iris and pupil region) of an iris region or a pupil region.

Regarding **claim 8**, *Daugman* discloses the counterfeit eye discrimination method of claim 2, wherein the extraction of the predetermined feature (fig. 4C to generate the code when fig. 4B Gabor filter above or below 0 creating the Hamming distance) is performed to a region



Art Unit: 2624

on or in a vicinity (the scanning areas in fig. 2 are in a "vicinity" of a line passing through both the center of a pupil and iris) of a line passing through a center of a pupil or a center of an iris.

Regarding **claim 9**, *Daugman* discloses the counterfeit eye discrimination method of claim 1, wherein the image processing includes the steps of:

performing frequency analysis ("quadrature bandpass filters" in 3:52-55; fig. 3; fig. 4) to the image data;

extracting a predetermined feature (fig. 4C to generate the code when fig. 4B Gabor filter above or below 0 creating the Hamming distance creating the Hamming distance) from the frequency-analyzed data.

Regarding **claim 10**, *Daugman* discloses a counterfeit eye discrimination method (fig. 1) comprising the steps of:

receiving image data of an image ("FIG. 2 is a photograph of a human eye" at 3:50-51; "a digitized image as illustrated in FIG. 2" at 5:1-2; fig. 1, item 10) including an eye (fig. 2);

performing band limitation ("quadrature bandpass filters" in 3:52-55; fig. 3; fig. 4) to the whole image data (the quadrature bandpass filters are applied to the whole image);

extracting a predetermined feature (fig. 4C to generate the code when fig. 4B Gabor filter above or below 0 creating the Hamming distance) from the band-limited image data; and

recognizing whether the eye is a counterfeit eye that is a reproduction of a living eye (the counterfeit eye is an image, the image itself is a "reproduction" of a living eye) or a living eye (2:45-49) based on data of the extracted feature.

Regarding **claim 11**, *Daugman* discloses the counterfeit eye discrimination method of claim 10,

wherein in the recognition step,  
distributions (fig. 10; fig. 6) of the predetermined feature of living eye images (“Authentics” in fig. 6) and counterfeit eye images (“Imposters” in fig. 6) are respectively prepared beforehand,

a distance to data of the extracted feature (fig. 4C to generate the code when fig. 4B Gabor filter above or below 0 creating the Hamming distance) from the feature distribution of the living eye images and a distance thereto from the feature distribution of the counterfeit eye images are calculated (all of the necessary distances calculations in fig. 6), and

the eye is judged to be an eye belonging to the distribution (fig. 6 with the cross-hatched rate areas), from which the calculated distance is the shorter between the living eye and the counterfeit eye (e.g. a Hamming distance of 0.2 is a shorter distance to a probable authentic image, the longer distance would be to an imposter image).

Regarding **claim 12**, claim 10 recites identical features as in claim 12. Thus, references/arguments equivalent to those presented above for claim 10 are equally applicable to claim 12.

Regarding **claim 13**, claim 10 recites identical features as in claim 13. Thus, references/arguments equivalent to those presented above for claim 10 are equally applicable to claim 13.

Regarding **claim 14**, *Daugman* discloses an iris authentication method (fig. 1) comprising the steps of:

performing iris authentication (fig. 1; fig. 1, item 28) based on image data of a photocopy image (“FIG. 2 is a photograph of a human eye” at 3:50-51; fig. 1, item 10) including an eye (fig. 2); and

performing the counterfeit eye discrimination method of claim 1 or claim 10 to the image data when a subject is authenticated as a person himself or herself (“confirming personal identity” in 4:27-29; 13:26-41) in the iris authentication step.

Regarding **claim 16**, *Daugman* discloses an image discrimination method (fig. 1) comprising the steps of:

receiving image data of an image (fig. 1, item 10); and

detecting presence or absence of roughness (roughness is a measurement of a small-scale variation; thus the small-scale variation between the stored reference code of an original iris and that of the present code in computing Hamming distance is a measure of “roughness”) in the image by image processing (fig. 1, item 26; fig. 6) to the image data,

wherein the image is judged to be an image projecting a printed matter (6:58-61 wherein a photograph is “printed matter”) when roughness is detected in the image.

### ***Claim Rejections - 35 USC § 103***

[7] The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

[8] **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over *Daugman* in view of U.S. Patent No. 4,641,349 (issued Feb. 3, 1987, hereinafter “Flom et al.”).

Regarding **claim 3**, while *Daugman* discloses the counterfeit eye discrimination method of Claim 2, *Daugman* does not teach wherein the predetermined feature is one of or a combination of two or more of moment, central moment, skewness and kurtosis of pixel values.

*Flom et al.* teaches what is considered one of the first (if not the first itself) iris recognition system wherein a predetermined feature is using the central moment (13:20-40).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the predetermined feature of *Daugman* to include using the central moment as taught by *Flom et al.* as “the present invention provides an identification technique based upon the recognition of the unique features of the iris and pupil, referred to herein as “iris identification”.”, *Flom et al.*, 1:45-48.

[9] **Claim 15** is rejected under 35 U.S.C. 103(a) as being unpatentable over *Daugman* in view of U.S. Pub. No. 2002/0107801 (published Aug. 8, 2002, hereinafter “Jones et al.”).

Regarding **claim 15**, while *Daugman* discloses a counterfeit printed matter discrimination method, characterized by comprising the steps of:

receiving image data of an image (fig. 1, item 10) of a photograph or real eye (fig. 2); and  
detecting presence or absence of roughness (roughness is a measurement of a small-scale variation; thus the small-scale variation between the stored reference code of an original iris and that of the present code in computing Hamming distance is a measure of “roughness”) in the image by image processing (fig. 1, item 26; fig. 6) to the image data,

wherein the photograph or real eye is judged to be a counterfeit printed matter (6:58-61 wherein a photograph would be “counterfeit printed matter”) when roughness is detected in the image, *Daugman* does not teach wherein the image is of a bill or valuable paper.

*Jones et al.* discloses an automated document processing system using full image scanning that teaches wherein the image is of a bill or valuable paper (fig. 4C)

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the image of *Daugman* to include a bill or valuable paper as taught by *Jones et al.* “to provide a document and currency processing system capable of processing documents utilizing full image scanning and a currency discriminator.”, *Jones et al.*, paragraph [0003].

### ***Conclusion***

[10] All claims are drawn to the same invention claimed in the earlier application and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the earlier application. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action in this case. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no, however, event will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

[11] Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID P. RASHID whose telephone number is (571)270-1578. The examiner can normally be reached Monday - Friday 7:30 - 17:00 ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on (571) 272-74155. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David P. Rashid/  
Examiner, Art Unit 2624

David P Rashid  
Examiner  
Art Unit 26244

/Vikkram Bali/  
Supervisory Patent Examiner, Art Unit 2624